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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/692,255

10/22/2003

Terry Lines

100-14310 (P04927-C1)

9418

33402

7590

02/17/2005

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EXAMINER

LEE, EUGENE

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 02/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

41A

Office Action Summary	Application No. 10/692,255	Applicant(s) LINES, TERRY	
	Examiner Eugene Lee	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213:

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-9 is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein 4,205,330 in view of Takagi 4,003,071. Klein discloses (see, for example, Fig _4) a MOSFET circuit (semiconductor circuit) comprising a depletion mode device (first transistor) wherein the depletion mode device comprises a first semiconductor region, source 37, drain 38, region (first channel) 30a, first gate oxide 29a, and gate 34; an enhancement device (second transistor) wherein the enhancement device comprises a second semiconductor region, source 35, drain 36, region (second channel) 30, second gate oxide 29, and gate 32.

Klein does not disclose the thickness of the layer of first gate oxide being substantially less than the thickness of the layer of second gate oxide. However, Takagi discloses (see, for example, FIG. 6A) a semiconductor device comprising a depletion mode transistor 63 with a gate insulating film 66, and an enhancement-type transistor 62 with a gate insulating film 65. The thickness of the gate insulating film 66 of the depletion mode transistor is substantially less than the thickness of the gate insulating layer 65 of the enhancement mode transistor. In column 8, lines 17-34, Takagi discloses that gate insulating layer of the depletion mode transistor permits the formation of the impurity diffused layer whereas the gate insulating layer of the enhancement mode transistor prevents it. Therefore, it would have been obvious to one of ordinary skill in the

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art to have the thickness of the layer of first gate oxide being substantially less than the thickness of the layer of second gate oxide in order to only form the layers necessary in the formation of an enhancement and depletion mode transistor, and to save in manufacturing steps.

Regarding the limitation “the first channel having a first dopant concentration” and the limitation “the second channel having a second dopant concentration”, see column 4, lines 7-11 wherein Klein discloses phosphorous, an n-type impurity, implanted to create the phosphorous doped region 30a, 30.

Regarding the limitation “the first transistor conducting more than leakage current when the gate, the source, and the first semiconductor region are connected to a same potential (which is a depletion device according to applicant’s specification on page 1)” and the limitation “the second transistor being substantially non-conductive when the gate of the second transistor, the source of the second transistor, and the second semiconductor region are connected to a same potential (enhancement device)”, see, for example, column 4, lines 10-11 wherein Klein discloses the depletion mode device with region 30a and the enhancement device with region 30.

Regarding claim 2, see, for example, column 4, lines 11-18, wherein Klein discloses the phosphorus implant at 30 will only have a small effect in the region of the enhancement type device and the region 30a of the depletion type device will produce a junction and an n-type surface channel which is more heavily doped than the substrate.

Allowable Subject Matter

3. Claims 3 thru 9 are allowed. The following is a statement of reasons for the indication of allowable subject matter: The references of record, either singularly or in combination, do not

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teach or suggest at least a semiconductor circuit comprising: a third transistor formed in the semiconductor material, the third transistor having a third channel and a layer of third gate oxide formed over the third channel, the third channel having a third channel length and a third dopant concentration, the layer of third gate oxide having a thickness, the third transistor being substantially non-conductive when zero volts are applied to the gate, the thickness of the layer of third gate oxide being substantially equal to the thickness of the layer of first gate oxide.

Response to Arguments

4. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

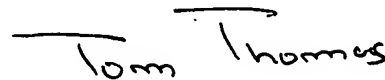
INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 571-272-1733. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eugene Lee
February 11, 2005

A handwritten signature in black ink that reads "Tom Thomas". The signature is written in a cursive style with a horizontal line above the first "T" and another horizontal line above the second "T".

TOM THOMAS
SUPERVISORY PATENT EXAMINER